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**BEFORE THE ARIZONA CORPORATION COMMISSION**

TOM FORESE, Chairman  
 BOB BURNS  
 DOUG LITTLE  
 ANDY TOBIN  
 BOYD W. DUNN

IN THE MATTER OF THE APPLICATION OF  
 ARIZONA PUBLIC SERVICE COMPANY FOR  
 A HEARING TO DETERMINE THE FAIR  
 VALUE OF THE UTILITY PROPERTY OF THE  
 COMPANY FOR RATEMAKING PURPOSES,  
 TO FIX A JUST AND REASONABLE RATE OF  
 RETURN THEREON, TO APPROVE RATE  
 SCHEDULES DESIGNED TO DEVELOP SUCH  
 RETURN.

Docket No. E-01345A-16-0036

Arizona Corporation Commission

**DOCKETED**

FEB 3 2017

DOCKETED BY  
*LM GB*

IN THE MATTER OF FUEL AND  
 PURCHASED POWER PROCUREMENT  
 AUDITS FOR ARIZONA PUBLIC SERVICE  
 COMPANY.

Docket No. E-01345A-16-0123

**NOTICE OF FILING DIRECT  
 TESTIMONY OF JEFF  
 SCHLEGEL ON BEHALF OF  
 SOUTHWEST ENERGY  
 EFFICIENCY PROJECT**


Southwest Energy Efficiency Project ("SWEEP"), through its undersigned counsel,  
 hereby provides notice that it has this day filed the attached direct testimony of Jeff Schlegel.

/ / /

/ / /

1 DATED this 3<sup>rd</sup> day of February, 2017.

2 ARIZONA CENTER FOR LAW IN  
3 THE PUBLIC INTEREST

4 By   
5 Timothy M. Hogan  
6 514 W. Roosevelt Street  
7 Phoenix, Arizona 85003  
8 *Attorneys for Southwest Energy Efficiency*  
9 *Project*

10 ORIGINAL and 13 COPIES of  
11 the foregoing filed this 3<sup>rd</sup> day  
12 of February, 2017, with:

13 Docketing Supervisor  
14 Docket Control  
15 Arizona Corporation Commission  
16 1200 W. Washington  
17 Phoenix, AZ 85007

18 COPIES of the foregoing  
19 electronically mailed this  
20 3<sup>rd</sup> day of February, 2017, to:

21 All Parties of Record

22   
23  
24  
25

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IN THE MATTER OF FUEL AND  
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AUDITS FOR ARIZONA PUBLIC SERVICE  
COMPANY.

Docket No. E-01345A-16-0123

Direct Rate Design Testimony of

Jeff Schlegel

Southwest Energy Efficiency Project (SWEEP)

February 3, 2017

**Direct Rate Design Testimony of Jeff Schlegel, SWEEP**  
**Docket No. E-01345A-16-0036**

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**I. INTRODUCTION**

**Q. Please state your name and business address.**

A. My name is Jeff Schlegel. My business address is 1167 W. Samalayuca Drive, Tucson, Arizona 85704-3224.

**Q. For whom are you testifying?**

A. I am testifying on behalf of the Southwest Energy Efficiency Project (SWEEP).

**Q. Please describe the Southwest Energy Efficiency Project (SWEEP).**

A. SWEEP is a public interest organization dedicated to advancing energy efficiency as a means to promote customer benefits, economic prosperity, and environmental protection in the six states of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. SWEEP works on state legislation; analysis of energy efficiency opportunities and potential; expansion of state and utility energy efficiency programs and the design of these programs; building energy codes and appliance standards; and voluntary partnerships with the private sector to advance energy efficiency. SWEEP collaborates with utilities, state agencies, environmental groups, universities, and energy specialists in the region. SWEEP is funded by foundations and the U.S. Department of Energy. I am the Arizona Representative for SWEEP.

**Q. What are your professional qualifications?**

A. I am an independent consultant specializing in policy analysis, evaluation and research, planning, and program design for energy efficiency programs and clean energy resources. I consult for public groups and government agencies, and I have been working in the field for over 30 years. I have testified before the Arizona Corporation Commission in many proceedings. In addition to my responsibilities with SWEEP in Arizona, I am working or have worked extensively in many states that have effective energy efficiency programs, including but not limited to California, Connecticut, Illinois, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, North Carolina, Ohio, Pennsylvania, Vermont, and Wisconsin, among others.

**Q. What is the purpose of your testimony?**

A. In my testimony, I cover a number of issues:

- The public interest in increasing electric energy efficiency and the importance of establishing resource procurement targets for energy efficiency, demand response, and energy storage in this proceeding.

- 1 • The large increases in the Basic Service Charge for residential and small general  
2 service customers should not be approved.  
3
- 4 • Mandatory demand charges for residential customers should not be adopted.  
5
- 6 • Properly designed time-of-use rates are the most appropriate and effective rate design  
7 for APS residential customers.  
8
- 9 • The proposed changes to the Lost Fixed Cost Revenue Recovery mechanism should  
10 be rejected. And,  
11
- 12 • The rate designs for municipal-owned street lights should reflect the actual operating  
13 hours and performance of new technologies including LEDs, controls, and metering.  
14

## 15 **II. THE PUBLIC INTEREST IN INCREASING ELECTRIC ENERGY EFFICIENCY**

### 16 **Q. What is the public interest in increasing electric energy efficiency?**

17  
18 A. Electric energy efficiency is in the public interest. Increasing energy efficiency will  
19 provide significant and cost-effective benefits for all APS customers, the electric system,  
20 the economy, and the environment. Electric energy efficiency is a reliable energy  
21 resource that is less expensive than other available energy resources. Consequently,  
22 increasing energy efficiency will save consumers and businesses money through lower  
23 electric bills and the deferral of unnecessary, more expensive resources. As a result  
24 energy efficiency lowers total costs for all customers.  
25

26 Increasing energy efficiency also reduces load growth; diversifies energy resources;  
27 enhances the reliability of the electricity grid; reduces the amount of water used for  
28 power generation; reduces air pollution; creates jobs that cannot be outsourced; and  
29 improves the economy. In addition, meeting a portion of load growth through increased  
30 energy efficiency can help to relieve system constraints in load pockets. By reducing  
31 electricity demand, energy efficiency mitigates electricity and fuel price increases and  
32 reduces customer vulnerability and exposure to price volatility. Energy efficiency does  
33 not rely on any fuel and is not subject to shortages of supply, increased prices, or price  
34 volatility of energy fuels.  
35

### 36 **Q. What are the estimated costs for energy efficiency savings?**

37  
38 A. Energy efficiency is a reliable energy resource that costs significantly less than other  
39 resources for meeting the energy needs of customers in APS's service territory. For  
40 example in 2015, the cost of energy efficiency programs per lifetime kWh saved was

1 \$0.012.<sup>1</sup> In comparison in APS's 2014 Integrated Resource Plan, the levelized cost of  
2 new generation for other energy resources is substantially more. For example, the cost of  
3 a natural gas combustion turbine is 2-to-4.5-times the cost of energy efficiency.<sup>2</sup>  
4

5 **Q. Why should energy efficiency be considered in the context of the APS rate case**  
6 **proceeding?**  
7

8 A. The Commission, in approving any order that changes or increases rates for customers,  
9 should ensure that the least cost resource – energy efficiency – is fully pursued.  
10 Consequently, in its order on the APS rate case, the Commission should ensure that APS  
11 is on a path to continue meeting the energy savings levels set forth in the Electric Energy  
12 Efficiency Standard and Rule ("EEES") and beyond; ensure that there is adequate  
13 funding to achieve the EEES energy savings levels and attain the associated customer and  
14 public benefits; and treat energy efficiency as the core energy resource that it is by  
15 providing a stable, long-term cost recovery mechanism and adequate funding in base  
16 rates.  
17

18 **III. THE STATUS OF APS'S ENERGY EFFICIENCY PROGRAMS FOR**  
19 **CUSTOMERS**

20 **Q. What energy efficiency programs and measures does APS offer to its customers?**  
21

22 A. APS offers a portfolio of programs for both residential and commercial customers.  
23 Specialized programs and offerings are available to all customer segments, including  
24 homeowners, renters, apartment dwellers, limited income customers, small businesses,  
25 schools, and large commercial and industrial ratepayers.  
26

27 Several of APS's energy efficiency programs have been recognized as national best  
28 practices. Examples of programs that have received national recognition include APS's  
29 Multi-family Energy Efficiency program, APS's Home Performance with ENERGY  
30 STAR<sup>®</sup> program, and APS's Solutions for Business program.<sup>3</sup> In fact, Pinnacle West was

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<sup>1</sup> Arizona Public Service, January-December 2015 Demand Side Management Report, March 1, 2016. Costs include the cost of rebates and incentives; training and technical assistance; consumer education; program implementation; program marketing; measurement, evaluation, and research; program development, analysis, and reporting costs; and performance incentives.

<sup>2</sup> Arizona Public Service Company, 2014 Integrated Resource Plan.

<sup>3</sup> Examples include: Wall Street Journal, "APS and Unisource AZ Utilities Get National Awards for Energy Efficiency," <http://online.wsj.com/article/PR-CO-20130328-914083.html>; Phoenix Business Journal, "APS, Meritage, Foundation for Senior Living tabbed for Energy Star awards," <http://www.bizjournals.com/phoenix/news/2013/03/26/aps-meritagefoundation-for-senior.html>; Greentech Media, "Multifamily Housing: A \$3.4B US Energy Efficiency Opportunity," <http://www.greentechmedia.com/articles/read/multifamily-housing-a-3.4b-u.s.-energy-efficiency-opportunity>



1 recently identified as one of the top five electric utility holding companies in the nation  
2 for its energy efficiency achievements.<sup>4</sup>

3  
4 **Q. At what levels has APS invested in energy efficiency in the past?**

5  
6 A. From 2011-2015 APS invested about ~\$310 million in energy efficiency.<sup>5</sup> The total  
7 budget for 2016 programs was ~\$64 million.

8  
9 **Q. What have APS's EE programs accomplished?**

10  
11 A. APS's cost-effective programs have delivered significant economic, energy, and  
12 environmental benefits for customers. For example, from 2011-2015, APS reports that its  
13 energy efficiency portfolio:

- 14  
15     ▪ Generated net benefits exceeding \$549 million dollars;  
16  
17     ▪ Delivered lifetime energy savings exceeding 24,466,100MWh; and  
18  
19     ▪ Saved 7,700 million gallons of water.<sup>6</sup>

20  
21 **Q. Have there been recent improvements to or expansions of APS's energy efficiency**  
22 **programs?**

23  
24 A. Yes. Commission Decision No. 75679, dated August 5, 2016, approved several  
25 enhancements to APS's residential and business programs. Examples of new energy  
26 efficiency measures that were approved include smart thermostats and new HVAC and  
27 lighting measures. As part of its decision, the Commission also established new demand  
28 reductions targets for APS; ordered APS to invest \$4 million in a residential energy  
29 storage pilot; and directed APS to consider several new and emerging technologies and  
30 strategies in its next energy efficiency plan filing.

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<sup>4</sup> Ceres, *Benchmarking Utility Clean Energy Deployment: 2016*, June 2016.

<sup>5</sup> See APS Annual Demand Side Management Reports for 2011-2015.

<sup>6</sup> See APS Annual Demand Side Management Reports for 2011-2015.



**IV. INCREASING ENERGY EFFICIENCY, DEMAND RESPONSE, AND  
ENERGY STORAGE TO REDUCE UTILITY BILLS FOR APS CUSTOMERS**

**Q. What should the Commission do to increase opportunities for APS customers to reduce their energy bills through energy efficiency?**

A. The Commission, in approving any order that increases rates for APS customers, should ensure that the least cost resource – energy efficiency – is fully pursued and that the public interest benefits of energy efficiency are fully realized.

**Q. What does SWEEP recommend and by when?**

A. Consistent with the Commission-adopted Electric Energy Efficiency Standard, which established cumulative annual energy savings requirements through 2020, and Commission Decision No. 75679, dated August 5, 2016, APS should be required to meet *at least* the following levels of annual energy savings from energy efficiency through 2020:

- 2017: 562,129 MWh
- 2018: 562,129 MWh
- 2019: 2562,129 MWh
- 2020: 562,129 MWh

APS should also be required to maintain at least this level of annual energy efficiency savings through 2025 as follows:

- 2021: 562,129 MWh
- 2022: 562,129 MWh
- 2023: 562,129 MWh
- 2024: 562,129 MWh
- 2025: 562,129 MWh

**Q. Has the Commission ordered APS to procure energy efficiency in prior rate cases?**

A. Yes, it has. In the 2005 and 2008 APS rate cases, APS was ordered to invest in and procure energy efficiency at levels established by the Commission.<sup>7</sup> The Commission similarly ordered Tucson Electric Power (TEP) to procure energy efficiency at the levels it established in TEP's 2007 rate case. In the 2008 APS rate case, the Commission also ordered APS to launch new energy efficiency programs such as the Residential Existing Homes Program.

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<sup>7</sup> See Commission Decision Nos. 67744 and 71488.

**Q. What does SWEEP recommend for demand response and energy storage?**

A. SWEEP also recommends that a demand response target be established for each year through 2025. SWEEP would support a broader peak demand reduction target that could include demand response and energy storage, or would support the establishment of separate requirements for demand response and energy storage. SWEEP prefers the latter because it would send clearer signals to market actors looking to invest in the state.

The MW level of the demand response and energy storage targets should be informed by the information, alternative proposals, and the review of the information and alternative proposals, which are being considered in the current Integrated Resource Planning (IRP) process. To be clear, SWEEP does not support the level of demand response or energy storage proposed by APS in its submitted IRPs; the APS levels are too low. Nor does SWEEP feel the IRP proceeding needs to be completed first; SWEEP is simply suggesting that the information in the IRP should be considered as background information in the rate case process. That said, SWEEP would be willing to consider a proposal from APS or from any other party for significantly higher targets for demand response and energy storage, and any such proposal could benefit from the information in the current IRP proceeding.

**Q. Has the Commission ordered APS to procure demand response in prior rate cases?**

A. Yes it has. Commission Decision 71488 ordered APS to plan for adding at least 250MW of commercial and industrial or residential demand response. Similarly Decision No. 69663 ordered APS to conduct a study to identify what types of demand response and load management programs would be most beneficial to APS's system.

The Commission has also ordered APS to procure demand response in other proceedings, even as recent as last year. See Commission Decision No. 75679, dated August 5, 2016, and referenced above.

**V. THE LARGE INCREASES IN THE BASIC SERVICE CHARGE FOR RESIDENTIAL AND SMALL GENERAL SERVICE CUSTOMERS SHOULD NOT BE APPROVED. APS'S PROPOSED CHANGES ARE NOT COST BASED OR IN THE PUBLIC INTEREST**

**Q. Describe the Company's proposal to increase the Basic Service Charge for residential customers.**

A. APS is proposing to increase rate base by \$433.4 million, of which \$165.9 million is for net new costs (customer net bill impact).<sup>8</sup> The Company has proposed to raise the Basic

<sup>8</sup> The \$165.9 million net increase is a combination of a non-fuel net bill impact of \$227.6 million and a fuel and purchased power decrease over base rates of \$61.7 million.

Service Charge (BSC) for residential and small general service customers to recover significant levels of this revenue increase. Proposed increases to the BSC for residential customers alone will increase revenue by at least \$75,912,645 million, approximately 46% of the APS-proposed \$165.9 million net increase.

To do so, APS is proposing to eliminate existing rates and move residential customers to four different rate options: three demand charge options; and one two-part rate option for smaller customers using less than 600kWh per month on average (R-XS).

Table 1 shows the proposed rate options, the number of customers on current rates that APS projects will move to each of the new rate options, and the associated change in the BSC that these customers will experience.

**Table 1. APS Current and Proposed Rates and BSCs<sup>9</sup>**

Proposed Rate	Current Rate	Customers	Current BSC	Proposed BSC	Change to BSC (\$)	Change to BSC (%)
<i>R-XS</i>	E-12	224,127	\$8.55	\$18.00	\$9.45	111%
	ET-1	10,012	\$16.68	\$18.00	\$1.32	8%
	ET-2	30,161	\$16.68	\$18.00	\$1.32	8%
	ECT-1R	428	\$16.68	\$18.00	\$1.32	8%
	ECT-2	1,726	\$16.68	\$18.00	\$1.32	8%
<i>R-1</i>	E-12	44,766	\$8.55	\$24.00	\$15.45	181%
	ET-1	25,237	\$16.68	\$24.00	\$7.32	44%
	ET-2	85,386	\$16.68	\$24.00	\$7.32	44%
	ECT-1R	2,963	\$16.68	\$24.00	\$7.32	44%
	ECT-2	16,716	\$16.68	\$24.00	\$7.32	44%
<i>R-2</i>	E-12	123,222	\$8.55	\$14.50	\$5.95	70%
	ET-1	35,224	\$16.68	\$14.50	\$(2.18)	-13%
	ET-2	91,574	\$16.68	\$14.50	\$(2.18)	-13%
	ECT-1R	2,320	\$16.68	\$14.50	\$(2.18)	-13%
	ECT-2	10,402	\$16.68	\$14.50	\$(2.18)	-13%
<i>R-3</i>	E-12	35,628	\$8.55	\$24.00	\$15.45	181%
	ET-1	52,958	\$16.68	\$24.00	\$7.32	44%
	ET-2	77,704	\$16.68	\$24.00	\$7.32	44%
	ECT-1R	17,951	\$16.68	\$24.00	\$7.32	44%
	ECT-2	60,030	\$16.68	\$24.00	\$7.32	44%

<sup>9</sup> The data in this table is based on APS H-4, which only includes 90.6% of total residential customers. Several rate classes with very low subscription rates are not included.

**Q. How many residential customers would see an increase in the BSC?**

A. A vast majority of APS residential customers will see significant increases in their BSCs. Assuming APS's projections are correct, 85% of APS residential customers will see increases to the BSC. Over 425,000 customers currently on E-12 will see increases to the BSC over 70%, 304,521 customers will see increases over 100%, and 80,394 customers will see increases of 181%.

**Q. Describe the Company's proposal to increase the BSC for small general service customers.**

A. APS is also proposing to increase the BSC for all small general service customer classes. These changes are outlined in Table 2. The BSC increases range from 45 to 73%.

**Table 2. APS Current and Proposed Rates and BSCs for E-32 S GS, E-32 XS GS, and E-32 TOU XS, by metering type**

Metering Type	Current BSC \$/day	Proposed BSC \$/day	Current BSC \$/month	Proposed BSC \$/month	Change \$	Change %
Self contained meters	0.672	1.16	\$20.16	\$34.80	\$14.64	73%
Instrument rated meters	1.324	2.02	\$39.72	\$60.60	\$20.88	53%
Primary voltage	3.415	4.947	\$102.45	\$148.41	\$45.96	45%

**Q. Does SWEEP support these proposed increases to the BSC?**

A. No. APS's proposed increases to the BSC are not cost justified and are not in the public interest, and therefore should be rejected.

First, they are not cost justified. It is a mistaken belief that all "fixed" costs should be assigned and recovered on an individual customer basis. In fact, only the costs directly related to serving the customer should be included as customer costs. My calculation of the direct, customer related costs for the residential and general service classes is less than half of the BSC proposed by APS in this proceeding and below APS's existing BSC under the E12 standard rate.<sup>10</sup> At most, a customer charge calculated including *only* the

<sup>10</sup> The basic service charge for E-12 standard is approximately \$8.55 per month (\$0.285 per day for 30 days).

1 basic customer costs, as appropriate, results in a residential BSC of \$8.05

2  
3 Second, the proposed increases are not in the public interest. Regardless of the method  
4 used to determine the BSC, the Commission must consider the policy implications of a  
5 high fixed component of a customer's bill and should reject any increase at this time.

6  
7 The Company's proposal would have many negative consequences. It would:

- 8  
9     ▪ Reduce the amount of control residential customers have over their bills.  
10  
11     ▪ Disproportionately harm low-use customers, many of whom are low-income  
12 customers.  
13  
14     ▪ Be punitive to apartment dwellers who have much lower than average costs.  
15  
16     ▪ Establish one of the highest BSCs in the western United States. And,  
17  
18     ▪ Mute the price signal to customers to conserve energy, become more energy efficient,  
19 and reduce their utility costs.  
20

21 **Q. Explain your first objection. Do you agree with Company Witness Miessner's**  
22 **proposed cost categories to recover in a BSC?**  
23

24 A. No, I do not. APS is relying on the results of its class cost of service study ("CCOSS") to  
25 support the large increases in the BSC. While the method used by APS is unclear in  
26 testimony, it closely resembles the Minimum System Method, but may even exceed the  
27 costs included in the Minimum System Method. Instead of describing a specific method,  
28 APS simply describes which cost categories APS decided to include in the BSC.  
29

30 Company witness Miessner describes the costs in direct testimony and includes the  
31 following: the service drop, point of delivery equipment, meter and meter reading system,  
32 billing system, related costs of producing monthly bill, customer care system and related  
33 operating costs, grid operations, communications and cyber security equipment, and  
34 distribution transformers.  
35

36 Many of the cost categories described by witness Miessner are not customer costs and are  
37 not traditionally recovered in the BSC. Including many of these costs is not cost-based  
38 and therefore will over-recover costs from some customers while under-recovering from  
39 others.  
40

41 **Q. Please explain.**  
42

43 A. Take distribution transformers as an example. Company witness Miessner wrongly  
44 asserts that distribution transformers are dedicated to serve a particular home and



1 therefore the costs of this transformer should be collected in a BSC. This is not true.  
2 Often times a single distribution transformer will serve the diverse needs of many  
3 residential customers, especially in the case of multifamily homes. For this reason,  
4 including the costs of distribution transformers in a BSC does not at all align with cost  
5 causation.  
6

7 **Q. Which costs should be recovered in a BSC?**  
8

9 A. The BSC should only include the costs associated with meters, billing, meter reading, and  
10 customer service. This approach is also known as the Basic Service Method and properly  
11 aligns cost recovery with cost causation. According to a study commissioned by the  
12 National Association of Regulatory Utility Commissioners, the Basic Service Method  
13 (also known as the Basic Customer Method) is a common method used in over 30  
14 states.<sup>11</sup> This method aligns with the original recommendations of Professor Bonbright on  
15 which costs should be classified as customer related.<sup>12</sup> These costs generally include  
16 those associated with meters, billing, and customer service. This is a long-standing  
17 definition and the appropriate method for determining the BSC.  
18

19 **Q. Does the Company's CCOSS justify the proposed increase in the BSC?**  
20

21 A. No. In the CCOSS, the Company determined customer costs of \$28.52 per residential  
22 customer.<sup>13</sup>  
23

24 This amount includes \$13.64 per residential customer for distribution plant costs that  
25 should be rejected as customer costs by this Commission because they are not customer  
26 related costs. These costs should be reclassified as demand or energy related.  
27

28 The remaining \$14.88 includes metering, billing, meter reading, and distribution  
29 (customer accounts, customer service, and sales).<sup>14</sup> The costs described as "distribution"  
30 amount to \$7.29 of the \$14.88 and also include several cost categories that should be  
31 rejected as customer related.  
32

33 **Q. Are you proposing specific BSC recommendations for residential customers?**  
34

35 A. Yes. I propose the Commission approve a BSC of \$8.05 for all residential rates. This  
36 BSC recommendation is cost based, consistent with the Basic Service Method, provides  
37 residential customers more control over a larger portion of their energy bills, and presents

---

<sup>11</sup> Weston, Fredrick. 2000. "Charging for Distribution Utility Services: Issues in Rate Design." Regulatory Assistance Project. <http://pubs.naruc.org/pub/536F0210-2354-D714-51CF-037E9E00A724>.

<sup>12</sup> Bonbright, James C. 1961. *Principles of Public Utility Rates*. Columbia University Press. p. 347-349.

<sup>13</sup> See APS Class Cost of Service Study, Schedule G-6-1.

<sup>14</sup> See Staff data request to APS 5.23 attached as Exhibit x.

1 customers with the proper price signals regarding conservation and energy efficiency.  
2

3 **Q. Can you describe your approach to calculating the BSC?**  
4

5 A. Exhibit SWEEP-1 shows my calculation of the BSC for the residential class. My BSC  
6 calculation includes only the direct costs which vary with the number of customers on the  
7 system. These costs include: meters, billing, the service drop, and customer installation  
8 expense. The calculation is based on the Company's proposed return on equity (ROE). If  
9 the proposed ROE is reduced or the capital structure is adjusted, the BSC  
10 recommendations would also need to be adjusted. This approach is consistent with the  
11 Basic Service Method of collecting only customer-related costs in a customer charge.  
12

13 **Q. How does the SWEEP BSC differ from the APS proposed BSC?**  
14

15 A. APS includes several additional cost categories that are not customer related. These cost  
16 categories include administrative and general costs in FERC accounts 901, 904, 905, 907-  
17 913, and 916. These are costs which do not vary based on the number of customers and  
18 should be rejected as customer related. Some of these costs include:  
19

- 20 • Advertising expenses (913)
- 21 • Demonstrating and selling expenses (912)
- 22 • Uncollectible account expense (904)
- 23 • Supervision costs (those not related to accounts 902 and 902)
- 24 • Customer assistance expense (908)  
25

26 **Q. Are there other large differences between the SWEEP and APS proposals?**  
27

28 A. Yes. The most significant difference is APS is proposing to include several categories of  
29 distribution plant in FERC accounts 364 (poles, towers, and fixtures), 365 (overhead  
30 conductors and devices), 366 (underground conductors and devices), and 368 (line  
31 transformers). These accounts are distribution plant related and should be rejected as  
32 customer related costs. The associated operation and maintenance (O&M) costs for these  
33 accounts should also be rejected as customer related.  
34

35 **Q. What portion of the distribution plant related costs is APS including in the  
36 residential BSC?**  
37

38 A. This is unclear from the CCOSS and subsequent data requests to the Company. The  
39 CCOSS by the Company is not user friendly, and it is nearly impossible to find specific  
40 costs in the study. Data requests to the Company also returned files that did not allow for  
41 a simple understanding of what levels of costs from specific FERC accounts were to be  
42 recovered in the BSC. Therefore, it is unclear what level of costs from the distribution



1 plant accounts are included in the BSC.  
2

3 **Q. Does the Company's proposed change in the BSC better align rate design with cost**  
4 **causation?**  
5

6 A. No, it does not. The proposed changes to the BSC will over collect costs from some  
7 customers and under collect them from others. As discussed in greater detail in an earlier  
8 answer, the distribution plant costs are caused by numerous customers with diverse  
9 characteristics. To recover these costs evenly among all residential customers is not cost  
10 based and should be rejected.  
11

12 Every customer in the utility system imposes different costs to the system. For example,  
13 apartment dwellers cost less to serve than single family homes. Customers with overhead  
14 lines are cheaper to serve than those with underground lines. Customers in rural areas  
15 cost more to serve than urban customers. Customers in APS's service territory are no  
16 exception to these realities and none of these points are addressed in the Company's  
17 current proposal.  
18

19 **Q. How would the Company's proposal reduce the amount of control residential**  
20 **customers have over their bills?**  
21

22 A. A BSC is a mandatory fixed fee that customers cannot avoid or control. When a higher  
23 BSC is implemented as part of an overall rate increase, customers are hit with a "double  
24 whammy." First their rates are increased significantly. Second their ability to respond and  
25 mitigate the impact of the rate increase is diminished significantly due to a higher BSC.  
26 APS's proposed 44-181% increase in the BSC would have a very significant impact on  
27 the portion of the bill that residential customers can control.  
28

29 **Q. How will increases in the BSC harm low income customers?**  
30

31 A. A high fixed charge also disproportionately impacts low-income customers who are often  
32 low-usage customers. These customers already struggle to pay their bills.  
33 Disproportionally increasing the total bill for these customers because of increases to the  
34 BSC does not adhere to cost causation principles and is not equitable. Not only is this an  
35 equity issue for low-income customers, but (as with all customers) increasing the fixed  
36 charge diminishes rewards for low-use/low-income customers investing in energy  
37 efficiency. And for low-use/low-income customers, these rewards are even less than they  
38 would be for the average customer because low-use customers will see higher rate  
39 increases and thus a higher hurdle to clear before they can get a return on investment in  
40 efficiency. It is already hard enough delivering meaningful, cost-effective efficiency to  
41 low-income customers; this increase makes it even harder.  
42

43 In addition, many low-use customers are apartment residents. Providing distribution  
44 service to multi-family housing is much cheaper than for single-family homes, because

there are economies of scale in meter reading, distribution circuits, transformers, and service drops. APS's proposal does not recognize the lower cost of service for multi-family housing where many low-use and low-income consumers reside.

**Q. How likely is it that low income households use less energy than average customers?**

A. Figure 1 shows an analysis prepared by the National Consumer Law Center that examines the usage of low-income households. It shows that households with incomes below 150% of the federal poverty level use between 9% and 30% less electricity than the households above 150% of the federal poverty level. In 2009, Arizona low-income households used 25.1% less electricity than Arizona households above 150% of the federal poverty level.

**Figure 1. Average 2009 Household Electricity Usage (KWH) by Status Above or Below 150% of Poverty. Source: 2009 U.S. EIA Residential Energy Consumption Survey data.**

Energy Information Administration, Residential Energy Consumption Survey Reportable Domain	Household income			Percentage Difference between average KWH low-income and non-low-income households
	Above 150% Poverty Level	At or Below 150% Poverty Level	All Households	
Connecticut, Maine, New Hampshire, Rhode Island, Vermont	8,453	5,920	7,940	-30.0%
Massachusetts	7,364	5,353	6,967	-27.3%
New York	7,039	5,431	6,578	-22.8%
New Jersey	9,155	6,760	8,902	-26.2%
Pennsylvania	10,733	8,992	10,402	-16.2%
Illinois	10,771	9,430	10,392	-12.5%
Indiana, Ohio	11,559	10,224	11,220	-11.6%
Michigan	9,206	7,508	8,695	-18.4%
Wisconsin	8,827	7,961	8,672	-9.8%
Iowa, Minnesota, North Dakota, South Dakota	11,288	8,198	10,719	-27.4%
Kansas, Nebraska	10,800	10,030	10,633	-7.1%
Missouri	13,775	13,602	13,740	-1.3%
Virginia	15,088	11,237	14,442	-25.5%
Delaware, District of Columbia, Maryland, West Virginia	14,437	12,711	14,100	-12.0%
Georgia	15,452	13,823	14,917	-10.5%
North Carolina, South Carolina	14,717	12,620	14,045	-14.2%
Florida	15,679	12,358	14,858	-21.2%
Alabama, Kentucky, Mississippi	16,307	12,915	15,236	-20.8%
Tennessee	15,766	13,512	15,132	-14.3%
Arkansas, Louisiana, Oklahoma	14,852	13,560	14,392	-8.7%
Texas	15,157	11,816	14,277	-22.0%
Colorado	7,745	5,752	7,439	-25.7%
Idaho, Montana, Utah, Wyoming	11,349	13,126	11,753	15.7%
Arizona	14,970	11,218	14,105	-25.1%
Nevada, New Mexico	10,580	9,643	10,369	-8.9%
California	7,256	5,732	6,888	-21.0%
Alaska, Hawaii, Oregon, Washington	12,841	11,726	12,570	-8.7%
Total	11,734	10,062	11,320	-14.2%

1 **Q. How does a higher BSC mute the price signal to customers to conserve energy and**  
2 **become more energy efficient?**

3 A. Increasing the BSC mutes the price signal to customers by reducing the amount of utility  
4 bill cost savings that customers experience when they conserve energy or become more  
5 energy efficient. As such, a higher BSC reduces the customer incentive to engage in  
6 energy efficiency opportunities because customers can affect only a smaller portion of  
7 their total utility bills. As a result, increasing the fixed charge portion of the customer's  
8 bill limits options for investment in energy efficiency for a customer.

9  
10 Commission policy should encourage and incent (through price signals and other means)  
11 customers to control their utility bills, and should provide opportunities and  
12 encouragement to reduce customer utility bills when lower cost options are available.  
13

14 **Q. Why is it important to send a price signal to customers to promote conservation and**  
15 **energy efficiency?**  
16

17 A. There are several reasons why this price signal is important to maintain. First, the  
18 Commission has clearly articulated a strong public policy goal of increasing energy  
19 efficiency. APS has offered successful energy efficiency programs that benefit customers  
20 for years. Significantly altering the price signal for customers to conserve and engage in  
21 energy efficiency is antithetical to the state policy goals related to energy efficiency.  
22 Second, discouraging wasteful use of electricity is a primary principle of rate design.  
23 When outlining his eight criteria for a sound rate structure, Professor Bonbright included  
24 "optimum-use or consumer-rationing objective, under which the rates are designed to  
25 discourage the wasteful use of public utility services" as a primary function of utility  
26 rates.<sup>15</sup>  
27

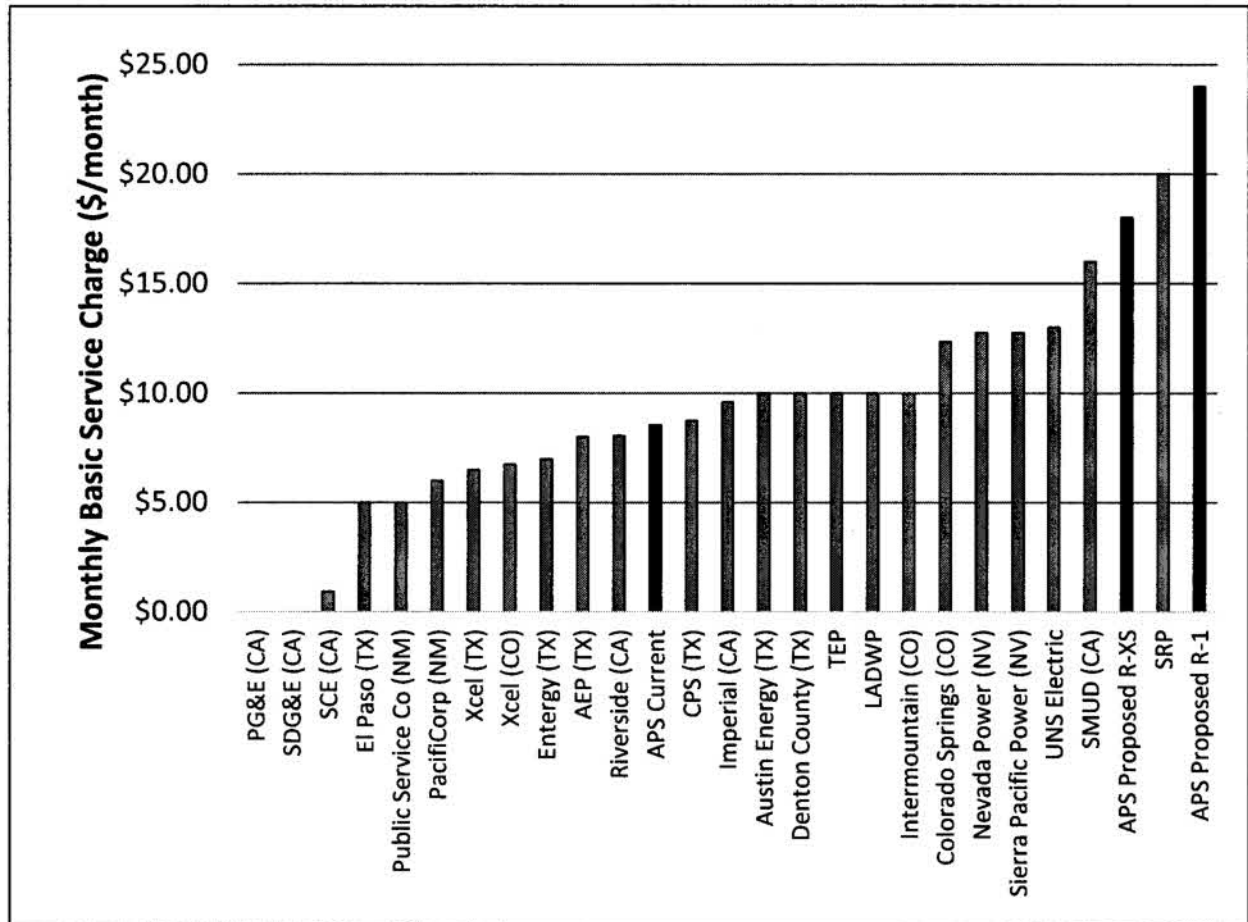
28 **Q. If APS's proposed residential BSCs are approved how would they compare with the**  
29 **residential BSCs of other western utilities?**  
30

31 A. If approved, the \$24 per month BSC for rates R-1 and R-3 would be the highest in the  
32 Southwest among investor owned utilities. Figure 2 shows the variation of residential  
33 BSCs for 24 investor owned utilities in the Southwest. The APS proposed BSCs are  
34 shown in red, with the current APS BSC in black.  
35

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<sup>15</sup> See Bonbright, James C. 1961. *Principles of Public Utility Rates*. Columbia University Press. p. 292.

1 **Figure 2: Residential BSC for Utilities in the Western Region<sup>16</sup>**



2  
3  
4 **Q. Given these objections, what does SWEEP recommend?**

5  
6 A. SWEEP recommends that APS's proposed increases to the BSC be rejected. SWEEP  
7 further recommends that the residential BSC be calculated using the Basic Service  
8 Method, which results in a residential customer charge of \$8.05, as calculated by  
9 SWEEP. For the extra small and small general service customers, SWEEP recommends  
10 the basic service charge be calculated using the Basic Service Method.<sup>17</sup>  
11

<sup>16</sup> Customer charge and minimum bill are from utility specific residential single-phase customer active tariff as of October 3, 2015.

<sup>17</sup> SWEEP did not calculate a BSC for small general service customers for this testimony. However, relying on APS response to Staff 5.23, we can determine the customer charge would likely be approximately \$12.33. This is based on using revenue cycle costs for metering, billing, and meter reading.

**VI. MANDATORY DEMAND CHARGES FOR RESIDENTIAL CUSTOMERS  
SHOULD NOT BE ADOPTED.**

**Q. Please describe APS's proposal to implement mandatory residential demand charges.**

A. APS is proposing to mandate that all residential customers using more than 600kWh be moved to one of three rate options with mandatory demand charges. The three options are outlined in the direct testimony of Company witness Miessner.

**Q. Do you support the Company's proposed demand rates?**

A. No, I do not. SWEEP strongly opposes mandatory residential demand charges.

**Q. Explain SWEEP's objections.**

A. The Commission should reject proposals to force all or most residential customers onto mandatory demand charges. Residential customers should have options and choice when it comes to their electric bills. Forcing all or most residential customers onto mandatory demand charges limits customers' options regarding how to control their bills. Customers should have options and should be able to choose a rate design that best fits their needs.

The mix of rate designs currently available to APS customers – including TOU and optional demand charges – actually is a reasonable mix of real options. And this mix of real options should be continued.

**Q. What other concerns does SWEEP have regarding mandatory residential demand charges?**

A. SWEEP is concerned with the ability of residential customers to respond to demand charges. It is more complex for a customer to understand how to reduce demand to control their bill. Most utilities have excluded small commercial customers (under 20 kW demand) from three-part rates for this reason.

There are a number of factors customers will need to understand and consider while making changes to reduce demand. For example, customers will need to understand the demand draw of each appliance and device in their home; the actions of individual household members over the course of the demand charge peak period; how these events interrelate at any given time; and how demand could be reduced. If customers are not able to respond, the proposed mandatory demand charges will be nothing more than an unavoidable cost for customers. In this situation, the demand charge presents the same problems as a high fixed charge, which I discussed previously.



1 **Q. Is SWEEP concerned about any specific customer class's ability to respond to**  
2 **demand charges?**  
3

4 A. Yes. SWEEP is especially concerned with the ability of limited or low income customers  
5 to respond to this type of rate design. Residential demand charges are essentially a high  
6 fixed charge for those customers unable to respond. Given that high fixed charges  
7 disproportionally harm low income customers, these customers will be further harmed by  
8 a mandatory residential demand charge.  
9

10 **Q. Why does income level matter in a discussion of residential demand charges?**  
11

12 A. There are several reasons why income level matters. The ability of customers to respond  
13 to changes in rates is dependent on a number of different factors, including  
14 socioeconomic factors such as income level. A swimming pool pump can be curtailed for  
15 a few hours without adversely affecting the customer's lifestyle; a refrigerator cannot –  
16 the frozen food melts. Additionally, low income customers may have more limited ability  
17 to afford associated technology to control demand. For a limited income customer who  
18 may not be able to respond to mandatory demand charges or afford load management  
19 technologies, the demand charge simply becomes an unavoidable fixed charge.  
20

21 **Q. Do you believe residential demand charges convey the proper price signals to**  
22 **customers?**  
23

24 A. No, demand charges do not convey the correct marginal price signals to customers.<sup>18</sup> This  
25 rate approach is also not cost based because the only distribution system component sized  
26 to individual customer demands is the final line transformer, and then only if there was  
27 one transformer per customer.<sup>19</sup> Distribution circuits are sized to the group demand, and  
28 generation and transmission are developed based on system peak demands and system  
29 load shapes. Including in demand charges significant costs that are not sized to  
30 individual customer demands will likely overcharge some customers while under  
31 charging others.  
32

33 **Q. How have recent mandatory residential demand charge proposals been received?**  
34

35 A. Recent experiences from two states are relevant. In Illinois, Exelon and Commonwealth  
36 Edison introduced legislation that would have resulted in the implementation of  
37 mandatory residential demand charges. The proposal was ultimately rejected last year due  
38 to considerable consumer backlash. Additionally, Republican Governor Bruce Rauner's  
39 office spoke out against these charges urging their rejection and calling them "insane

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<sup>18</sup> Stokke, A. V., G. Doorman, and T. Ericson. 2009. *An Analysis of a Demand Charge Electricity Grid Tariff in the Residential Sector*. Discussion Papers No. 574 January 2009, Statistics Norway, Research Department.

<sup>19</sup> Lazar, J. and W. Gonzalez. 2015. *Smart Rate Design for a Smart Future*. Regulatory Assistance Project.

1 rates.”<sup>20</sup>

2  
3 In Kentucky, the implementation of mandatory residential demand charges by the  
4 Glasgow Electric Plant Board generated vocal opposition. Some consumers reported bill  
5 increases of up to 400%. In August, Attorney General Andy Beshear intervened. At his  
6 request, the Board created an alternative option without demand charges.<sup>21</sup>

7  
8 Interestingly, when APS’ residential demand charge tariff was originally approved in  
9 1980, it also received opposition. When the rate was approved, it was mandatory for new  
10 residential customers with refrigerated air-conditioning.<sup>22</sup> However, the tariff was  
11 modified by the Commission three years later due to, “Complaints that the mandatory  
12 nature of the [rate] produced unfair results for low volume users.”<sup>23</sup>

13 **Q. Have Arizona Commissioners raised recent concerns about mandatory residential**  
14 **demand charges?**

15 **A.** Yes they have. In both the UNS Electric (UNSE) and Trico Electric rate cases,  
16 Commissioners filed letters addressing their concerns.

17  
18 ■ Commissioner Andy Tobin wrote, “I have great misgivings of applying mandatory  
19 demand charges to customers unless and until they feel confident in knowing what  
20 that rate looks and feels like through shadow billing and how they can adjust their  
21 electric consumption in an optimal manner with the latest energy efficiency  
22 technology. Let us not forget in the UNSE case that it was Commission Staff, on their  
23 own volition, who proposed mandatory demand charges for all customers. Every  
24 Commissioner, either in writing or verbally at an Open Meeting supported my  
25 position to completely remove mandatory demand charges from the UNSE rate  
26 design.”<sup>24</sup>

27  
28 ■ Commissioner Doug Little wrote, “Whatever merits the concept of mandatory three  
29 parts rates might appear to have in the abstract, the adverse effect they could have on  
30 the economic and social realities faced by ratepayers in the UNSE service territory  
31 are profound and very concerning to me.” He also urged involved parties to “pay  
32 particular attention to alternatives not requiring a mandatory residential demand

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<sup>20</sup> See memo of Jason Heffley, Policy Advisor for Energy and Environment for Governor Rauner dated November 21, 2016.

<sup>21</sup> “Attorney General stops in Glasgow to talk EPB,” 13 WBKO, October 5, 2016.

<sup>22</sup> See Commission Decision No. 51472

<sup>23</sup> See Commission Decision No. 53615

<sup>24</sup> Letter of Commissioner Tobin dated October 12, 2016, in Docket E-01461A-15-0363



1 charge.”<sup>25</sup>

- 2
- 3 ■ Commissioner Bob Burns wrote, “I have serious concerns about implementing a  
4 mandatory demand charge, particularly in the case at hand and would like to see more  
5 in-depth rate design alternative evidence from the parties.”<sup>26</sup>
- 6

7 **Q. Do you support the APS proposal to implement mandatory demand charges for**  
8 **rates E-32 XS and E-32TOU XS?**

9

10 A. No, I do not. In my opinion, these customers should not be on mandatory demand charges  
11 because of the reasons I’ve discussed above. Mandatory demand charges send distorted  
12 price signals and many of these small business customers may have difficulty responding  
13 to this rate.

14

15 **Q. Do you recommend any other alternatives for the proposed mandatory (for most**  
16 **residential customers) demand charge that would be effective in reducing peak**  
17 **demand and also be an attractive option for APS customers?**

18

19 A. Yes. I recommend that APS increase emphasis on time-of-use rates instead of three part  
20 rates. Time-of-use (TOU) rates are a superior rate design for reducing peak demands and  
21 are well known and understood by customers. A recent report by the Rocky Mountain  
22 Institute noted that well designed time based rates (including time-of-use, critical peak  
23 pricing, or peak time rebates) “are effective at achieving their objective of providing a  
24 price signal to customers about when to use energy.”<sup>27</sup> This same report noted that several  
25 regions are transitioning to default TOU rates because of this effectiveness.

26

27 APS has utilized TOU rates with success for decades. In fact, APS’ data suggests that  
28 TOU rates are much more palatable to APS customers than three part rates. Indeed more  
29 than 40% of APS’s total residential customers are now on a TOU rate. In comparison,  
30 only 11% of APS’s residential customers have enrolled in a demand rate, despite the fact  
31 that APS has marketed this option for more than three decades. This finding suggests that  
32 ~ 90% of APS’s residential customers have either not gained an understanding of how the  
33 demand charge rate would impact them, or they have decided that the demand charge rate  
34 is not the best option for them.

35

36

37

38

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<sup>25</sup> Letter of Chairman Little dated April 25, 2016, in Docket E-04204A-15-0142.

<sup>26</sup> Letter of Commissioner Burs dated April 13, 2016, in Docket E-04204A-15-0142.

<sup>27</sup> See Rocky Mountain Institute “A Review of Alternative Rate Designs: Industry Experience with Time-Based and Demand Charge Rates for Mass-Market Customers.” May 2016.

**VII. RECOMMENDED RATE DESIGN: PROPERLY DESIGNED TOU WITH LOWER BSC**

**Q. What is SWEEP's alternative to the large increases in the BSC and the demand charges proposed by APS? What rate design is best?**

A. As noted in the section above, SWEEP recommends properly designed TOU rates as the appropriate and effective rate design for residential customers. Properly designed TOU rates should have lower BSCs and shorter on-peak windows that customers can actually work with as a better alternative than higher fixed charges for customers and higher BSCs in particular.

TOU rates give customers more control over their energy bills, have less harmful impacts on lower usage customers, help reduce wasteful energy use and peak demand by sending effective price signals, and give APS a reasonable opportunity to recover its authorized costs. They also align the interests of the Company with the interests of its customers.

**Q. What recommendations does SWEEP have for properly designed TOU rates?**

A. SWEEP recommends the following for the proper design of TOU rates, to ensure their effectiveness at sending the correct price signals, and to work for customers:

- Lower BSC – give customers control over more of their energy bill: \$8.05 or lower for residential;
- Shorter on-peak windows (3 hours, summer and winter);
- Meaningful spread or differential (3-4 times) between on-peak and off-peak prices, to send a meaningful price signal.

**VIII. APS-PROPOSED CHANGES TO THE LOST FIXED COST REVENUE RECOVERY MECHANISM SHOULD BE REJECTED**

**Q. Please summarize the Company's proposed changes to the Lost Fixed Cost Revenue Recovery (LFCR) mechanism.**

A. As described in the testimony of Leland Snook, APS is requesting, among other changes, that (1) the LFCR provide for the recovery of lost fixed-cost revenues associated with 100% of transmission, distribution, and generation costs; and (2) the year-over-year cap on the LFCR be increased to 2%.

1 **Q. What are the Company's stated reasons behind these proposed changes?**

2  
3 A. Company witness Snook asserts these changes are necessary for APS to collect  
4 generation related lost revenues from energy efficiency and distributed generation, and to  
5 increase the amount of lost revenue recovery APS would collect from customers.  
6

7 **Q. Does SWEEP support any of the APS-proposed changes to the LFCR?**

8  
9 A. No. The Commission should take great caution in reviewing the Company's proposal and  
10 should not approve any changes that increase the amount of lost revenue recovery  
11 collected from customers compared to the existing LFCR mechanism.  
12

13 **Q. Do you have a recommendation to address Company witness Snook's concerns?**

14  
15 A. Yes. As an alternative to the LFCR approach, the Company should propose a full revenue  
16 decoupling mechanism to ensure full recovery of authorized revenues. Full revenue  
17 decoupling with a symmetrical adjustment of over- or under-recovered revenues reduces  
18 risk for APS and its customers simultaneously. Revenue decoupling will also reduce the  
19 economic disincentive for the Company to promote conservation and energy efficiency.  
20

21 Lost fixed cost revenue recovery mechanisms have many flaws and problems. These  
22 problems include: a reliance on evaluation or estimates to substantiate lost revenue  
23 claims, maintaining complex lost revenue tracking systems to ensure the Company is  
24 collecting the correct amount of lost revenues, the one-sided nature of the LFCR  
25 mechanisms (they only result in a charge to customers and do not provide for a credit to  
26 customers if the Company collects actual revenues higher than authorized revenues), and  
27 the risk of the Company over earning Commission authorized revenues.  
28

29 **IX. THE RATE DESIGNS FOR MUNICIPAL-OWNED STREET LIGHTS**  
30 **SHOULD REFLECT THE ACTUAL OPERATING HOURS AND**  
31 **PERFORMANCE OF NEW TECHNOLOGIES INCLUDING LEDS,**  
32 **CONTROLS, AND METERING.**

33 **Q. How are rates for municipal-owned street lighting calculated?**

34  
35 A. Street lighting customers are charged an amount per fixture based on an estimated  
36 amount of energy each type of fixture will consume within a month.  
37

38 **Q. What are SWEEP's concerns regarding APS' proposed rates for street lighting?**

39  
40 A. SWEEP is concerned that APS' calculation of rates for street lighting may be based on an  
41 inaccurate methodology for estimating monthly energy consumption. This methodology  
42 may be overestimating the amount of time that street lights are actually on and thus  
43 overestimating energy consumption by as much as 20% (e.g., estimating 12 hours rather

1 than 10 hours). This means that municipalities may be charged more for electricity than  
2 necessary. SWEEP has spoken with the City of Phoenix, and understands that Phoenix  
3 and other municipalities share this concern.  
4

5 **Q. Are there alternatives to APS' methodology that could ensure more accuracy?**  
6

7 A. Yes. There are two ways that energy consumption from street lights could be more  
8 accurately determined. The first would be to use built-in, utility grade metering  
9 equipment that often comes with newer LED systems. Many cities have invested in  
10 energy efficient LED street lighting in recent years. If such systems have metering  
11 capabilities available, they could be used to directly measure street light energy  
12 consumption. The second method would be to use a sample-based approach in which  
13 actual consumption is metered for a certain sample number of fixtures (e.g. 30-50  
14 fixtures) then extrapolated system-wide.  
15

16 **Q. What methodology does SWEEP propose? What does SWEEP recommend?**  
17

18 A. SWEEP would support adoption of either (or both) of these methodologies to determine  
19 actual energy usage as an improvement over the current approach. APS should work with  
20 municipalities in its service territory to implement either or both of these methods.  
21

22 SWEEP's primary recommendation is for the APS rates for municipal-owned street lights  
23 to be based on actual energy consumption, determined using actual wattage (which is  
24 important for energy-efficient lighting) and actual hours of operation.  
25

26 **X. CONCLUSION**

27 **Q. Does this conclude your testimony?**

28 A. Yes.  
29

1 **SWEEP EXHIBIT 1 – CALCULATION OF BASIC SERVICE CHARGE FOR**  
2 **RESIDENTIAL CUSTOMER CLASS**

<b>Expenses</b>	<b>Account</b>	<b>Residential</b>
Meters	597	\$0
	586	\$4,535,843
	Depreciation	\$13,635,614
Services	587	\$451,498
	Depreciation	\$7,059,546
Meter Reading	902	\$1,918,588
Billing	903	\$38,852,643
Subtotal Expenses		\$66,453,731
Net to Gross on Expenses		89%
Total Expenses		\$74,650,338
<b>Rate Base</b>		
Meters		
Plant In Service	370	\$235,298,386
Less Accumulated Depreciation		\$(174,585,527)
Net Plant		\$60,712,859
Depreciation Expense		\$13,635,614
Services		
Plant In Service	369	\$283,241,237
Less Accumulated Depreciation		\$(111,540,648)
Net Plant		\$171,700,589
Depreciation Expense		\$7,059,546
Meters		\$60,712,859
Services		\$171,700,589
Total Rate Base		\$232,413,448
Grossed Up Return (10.5 ROE)	11.91%	\$27,687,868
<b>Total Customer-Related Revenue Requirement</b>		<b>\$102,338,206</b>
<b>Annual Bills</b>		<b>12,711,504</b>
<b>\$/Month</b>		<b>\$8.05</b>

3